Claims

1. A method of regenerating a reactor, characterized in that ammonium salts formed as by-product in the reactor are brought into the gas phase at temperatures of ≥ 150°C and taken from the reactor in gaseous form.

2. A process for preparing a product, in which ammonium salt is formed as by-product, characterized in that a regeneration step in which ammonium salts formed as by-product are brought into the gas phase at temperatures of ≥ 150°C.

3. The process as claimed in claim 2, characterized in that the ammonium salts which have been brought into the gas phase are separated off.

4. The process as claimed in either of claims 2 and 3, characterized in that the product is a single-component precursor of nonoxidic ceramics.

5. The process as claimed in claim 4, characterized in that the product is a compound which has the structural feature X-N-Y, where X and Y can each be, independently of one another, Si, P, Al, Ti, V, Zr, B, Ga or/and In.

6. The process as claimed in any of claims 2 to 5, characterized in that the compound has the formula (I) $R_xHal_{3-x}Si-NR^1-BR_yHal_{2-y}$,
where the radicals Hal are each, independently of one another, Cl, Br or I,
the radicals R are each, independently of one another, a hydrocarbon radical having from 1 to 20 carbon atoms or hydrogen,
R^1 is a hydrocarbon radical having from 1 to 20 carbon

atoms or hydrogen,
x is 0, 1 or 2 and
y is 0 or 1.

7. The process as claimed in any of claims 2 to 4, characterized in that the synthesis of the product, in particular a single-component precursor, is carried out in a two-stage reaction process, in particular in the gas phase.

8. The process as claimed in any of claims 2 to 7, characterized in that the process comprises the steps

(i) synthesis of a product, in particular a single-component precursor of nonoxidic ceramics having a nitrogen bridging function, in a two-stage reaction, in particular in the gas phase and

(ii) regeneration of the reactor by heating to temperatures of ≥ 150°C.

9. The process as claimed in any of claims 2 to 8, characterized in that the synthesis phase and the regeneration phase are carried out alternatively a plurality of times and, in particular, are carried out cyclically in succession.

10. The process as claimed in any of claims 2 to 9, characterized in that the switching over between the synthesis phase and the regeneration phase is controlled by the total pressure drop in the reaction steps.

11. The process as claimed in any of claims 2 to 10, characterized in that the change between production phase and regeneration phase is controlled by a temperature change.

12. A pseudocontinuous process for preparing a product, in which an ammonium salt is formed as by-product and the preparation is carried out in a two-stage reaction, characterized in that two apparatuses are used per reaction stage, of which one is operated in the production mode and the other is operated in the regeneration mode, i.e. at temperatures of ≥ 150°C.

13. The process as claimed in any of the preceding claims, characterized in that the product is isolated from the remaining components of the reaction mixture, in particular by crystallization, condensation and/or the use of a solvent.

14. The process as claimed in any of claims 2 to 13, characterized in that unreacted starting materials are recycled.

15. The process as claimed in any of claims 1 to 14, characterized in that $MeNH_2$ and at least one of the compounds $SiCl_4$, BCl_3, PCl_3, PCl_5, $AlCl_3$, $GaCl_3$, $InCl_3$, $TiCl_4$, VCl_3, VCl_4, $ZrCl_4$ or $TaCl_5$ are used as starting materials for the first reaction step.

16. The process as claimed in any of claims 1 to 15, characterized in that the intermediate product from the first reaction step and at least one of the compounds $SiCl_4$, BCl_3, PCl_3, PCl_5, $AlCl_3$, $GaCl_3$, $InCl_3$, $TiCl_4$, VCl_3, VCl_4, $ZrCl_4$ or $TaCl_5$ are used as starting materials for the second reaction step.